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grown, and without further application of nitrogen.

The final analyses of the crops and soils showed that the organic nitrogen contained in the cow peas, and accumulated largely from the air, was utilized by the succeeding non-leguminous crop, and that there was a gain of nitrogen in the soils where no cow peas were grown, and that such gains were greatest where the largest amount of manure had been applied.

The Detection of Methyl Alcohol: HEYWARD SCUDDER.

The formation of methyl salicylate is not a reliable test, because ethyl salicylate has almost the same odor. The Riche and Bardy test takes too long to be of practical value. The Trillat test (delicacy 0.2 per cent.) is uncertain. The deepening of the blue on heating is characteristic. Wolf and Robine state that Trillat's test is not reliable and give modifications that may be of value in cases of doubt. The Haigh (delicacy 5 per cent.) and Spanglé-Ferrière (delicacy 1 per cent.) tests use phloroglucine to show the presence of formaldehyde. The color obtained varies with the concentration of the formaldehyde. A blank test with ethyl alcohol must always be made. The effect of heat is characteristic. By using proper conditions a rapid test (delicacy 2 per cent.) can be made. The Mulliken, Scudder test (delicacy 3 per cent.) is very reliable because of the formation of flocks as well as color. On account of the uncertainty of color tests for small amounts, it is advised first to try a rapid test and, if no definite result is obtained to concentrate by fractionation.

The Origin of Radium: BERTRAM B. BOLTWOOD.

It had been shown in previous papers that the determination of the relative quantities of uranium and radium in a number of minerals strongly indicates a constant ratio between the quantities of these elements occurring together. In the present paper improved methods for the quantitative determination of both radium and uranium are described, and the results obtained from an examination of twenty-

two separate samples, comprising twelve distinct mineral species, are given. These results show a constant proportionality between the quantities of radium and uranium in all of the samples examined, and lead to the inevitable conclusion that uranium is the parent of radium.

F. H. POUGH,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE NATURALIST'S UNIVERSAL DIRECTORY.

A NEW edition of the 'Naturalist's Directory' has recently come to hand. In casually turning the leaves I noticed that the names of Joseph Le Conte and J. W. Powell were still retained in the list of American naturalists, although their deaths had occurred as long ago as 1901 and 1902. These lapses suggested that the directory might not be trustworthy in other respects, and at my suggestion an associate compared its lists with various other lists of scientific men, for the purpose of testing its accuracy and fullness. The practical utility of Cassino's directory in the past seems to be attested by the fact that it has reached its nineteenth edition, and I therefore feel justified in presenting, as a matter of general information, some of the results of the examination.

In order to judge of its fullness a comparison was made with the contemporary lists of a few scientific organizations whose membership is carefully selected on the basis of scientific ability or accomplishment. Of 90 members of the National Academy of Sciences the directory fails to include 28. It omits 129 of the 329 members of the Washington Academy of Sciences, 57 of the 233 members of the American Society of Naturalists, 11 of the 46 fellows of the American Ornithologists Union, and 54 of the 259 fellows of the Geological Society of America. Probably some members of each organization are not within the scope of the directory, but this remark can not apply to such men as Outram Bangs, C. F. Batchelder, Lyman Belding, Franz Boas, Lewis Boss, A. P. Chadbourne, C. F. Chandler, S. C. Chandler, W. W. Cooke, G. A. Dorsey, Wm. Dutcher, H. G. Dyar, H. W. Fairbanks, W. G. Farlow, J. W. Fewkes, Henry Gannett, A. C. Gill, L.

P. Gratacap, C. S. Hastings, J. P. Iddings, C. L. Jackson, S. P. Johnson, S. C. Keith, N. T. Lawrence, G. Lefevre, C. K. Leith, E. W. McBride, L. B. Mendel, T. C. Mendenhall, A. A. Michelson, John Muir, E. W. Nelson, E. L. Nichols, A. E. Ortmann, Wm. Palmer, H. S. Pritchett, T. M. Prudden, H. A. Purdie, E. F. Smith, J. C. Smock, R. Thaxter, O. H. Tittmann, John Trowbridge, W. L. Underwood, Lester F. Ward, A. G. Webster, E. L. Wells, C. A. White, S. W. Williston, H. C. Wood and R. R. Wright. It was not practicable to apply a similar test to the foreign lists, and it may be that they are fuller.

To test the accuracy of the addresses given they were compared with lists, of approximately the same date, published by the Washington Academy of Sciences, the Geological Society of America, the American Society of Naturalists and the American Ornithologists Union, and with 400 other addresses taken at random from 'Who's Who in America' and the lists of the American Association and the affiliated societies of Washington. In all about 750 addresses were compared, and it was found that about ten per cent. of those given by the directory are erroneous. Similar comparison was made of 291 names common to the directory and the list of the Geological Society of London, with the result that 52 addresses were found to be discrepant, but in this case it was not possible to say how many were wrong.

Of deceased scientists so notable that their deaths are recorded in the necrologies of the National Academy, the *American Journal of Science*, or the American 'Who's Who,' no less than 49 are retained by the directory. Among these are not only Powell and Le Conte, already noted, but Elliott Coues, Horatio Hale, James Hall, J. Willard Gibbs, St. George Mivart, Henry Morton, A. E. Nordenskiöld, H. A. Rowland and Rudolph Virchow.

The arrangement of the names is by countries, with a classification which has been gradually evolved through successive editions. Part I. comprises, first, the United States and Canada, and then, in order, Great Britain, Central America, South America, Oceanica and Africa. Central America is made to in-

clude not only the usual states, but Mexico, Newfoundland and the islands of the West Indies; and the countries of Asia are placed under Oceanica. Part II. includes all the countries of Europe except Great Britain. The use of Part II. is facilitated by having its parts arranged in alphabetic order, and by the insertion of the name of the country at the head of each page; but these devices are not used in Part I. In some of the earlier editions the entries for the United States and Canada were numbered *seriatim* and a special index of departments of science referred to these numbers. From the present edition the index is omitted, but the numbers survive as a vestigial character.

The personal list for the United States and Canada is followed by a list of scientific societies of the same countries, with a classification by states. Being a resident of Washington, I turned, naturally, to the list for the District of Columbia, and noted at once the omission of the Washington Academy of Sciences and of nine out of the twelve scientific societies affiliated with it. Of the three affiliated societies that are listed the data for two are obsolete. The American Association for the Advancement of Science, which for seven years has had its headquarters in Washington, is still credited to Salem, the place of publication of the directory.

Despite these limitations the directory is a useful volume. It contains the names of about 18,500 scientists, with information as to addresses and specialties, and the greater part of the information is correct.

G. K. GILBERT.

AN OVERLOOKED FORM OF STEREOSCOPE.

IN SCIENCE of November 18, 1904, Professor Jastrow describes, under the above heading, an ingenious modification of the mirror stereoscope, permitting the use of the ordinary stereoscopic card.

The arrangement described below, serving the same purpose, appears to possess some advantages. It is quite possible that this form may have been suggested before, but it has not come under my notice.

In all arrangements of this kind it is of